IN THE CLAIMS:

Please cancel Claims 3-8 without prejudice or disclaimer of the subject matter recited therein.

Please amend Claims 1, 9, 10, 14-16, 19-23, 26, 28, 30, 35 and 37 as follows. A marked-up copy of the amended claims showing the changes made thereto, is attached. Note that all the claims currently pending in this application, including those not presently being amended, have been reproduced below for the Examiner's convenience.

1. (Amended) A projection optical system for projecting an image of an object onto an image plane, comprising:

a first imaging optical system for forming an image of the object, said first imaging optical system including a first mirror for reflecting and collecting abaxial light from the object, and a refractive lens having a positive refractive power;

a second imaging optical system for re-imaging the image upon the image plane;

a second mirror for reflecting light from said first mirror to the image plane side, whereby the abaxial light is caused to pass outside of an effective diameter of said first mirror; and

a lens group having a negative refractive power and being disposed between said first and second mirrors and between said first mirror and said refractive lens.

2. (Not Amended) A projection optical system according to Claim 1, wherein said first imaging optical system has a magnification β which satisfies a relation $|\beta| \geq 1$.

9. (Amended) A projection optical system according to Claim 1, further comprising a field optical system disposed between said first and second imaging optical systems, for projecting a pupil of said first imaging optical system onto said second imaging optical system, wherein said first imaging optical system comprises a first mirror group of positive refracting power, including at least said first mirror, and a second mirror group including said second mirror, wherein light from said first mirror group as reflected by said second mirror group is caused to pass outside of an effective diameter of said first mirror group.

10. (Amended) A projection optical system according to Claim 9, wherein said second imaging optical system is constituted by lenses only and has a positive refracting power.

11. (Not Amended) A projection optical system according to Claim 9, wherein said second imaging optical system has a magnification BG2 which satisfies a relation - $0.5 < BG2 < -0.05$.

12. (Not Amended) A projection optical system according to Claim 9, wherein said first imaging optical system has a magnification BG1 which satisfies a relation - $40.0 < BG1 < -0.5$.

13. (Not Amended) A projection optical system according to Claim 9, wherein said field optical system is all constituted by lenses.

14. (Amended) A projection optical system according to Claim 9, further comprising a field optical system including a first field mirror group having a first field mirror and a second field mirror group including a second field mirror, wherein abaxial light passed through the outside of the effective diameter of said first mirror group is reflected by said first field mirror and said second field mirror, in this order, and after that, the light passes a region adjacent the optical axis of said first field mirror and enters said second imaging optical system.

15. (Amended) A projection optical system according to Claim 14, wherein said first field mirror comprises a concave mirror and wherein said second field mirror comprises a convex mirror.

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16. (Amended) A projection optical system according to Claim 14, wherein said first field mirror comprises a concave mirror and wherein said second field mirror comprises a concave mirror.

17. (Not Amended) A projection optical system according to Claim 9, wherein relations $P1 < 0$ and $Pf+P2 > 0$ are satisfied where P1, Pf and P2 are Petzval sums of said first imaging optical system, said field optical system and said second imaging optical system, respectively.

18. (Not Amended) A projection optical system according to Claim 9, wherein a relation $0.6 < e/LM1 < 2.5$ is satisfied where LM1 is a paraxial distance between the

object and said first mirror, and e is a distance from the object to a pupil conjugate point defined by an optical element positioned at the object side of said first mirror.

19. (Amended) A projection optical system according to Claim 9, wherein the distance LM1 satisfies a relation $0.5 < OIL/(LM1 + 2xLM2) < 20$, where LM2 is a paraxial distance between said first and second mirrors, and OIL is a paraxial distance along the optical path, from the object to the image defined by said first imaging optical system, wherein LM1 is a paraxial distance between the object and said first mirror, and LM2 is a paraxial distance between said first and second mirrors.

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20. (Amended) A projection optical system according to Claim 9, wherein the distances LM1 and LM2 satisfy a relation $0.2 < LM2/LM1 < 0.95$, wherein LM1 is a paraxial distance between the object and said first mirror, and LM2 is a paraxial distance between said first and second mirrors.

21. (Amended) A projection optical system according to Claim 9, wherein the distance LM1 satisfies a relation $0.15 < LM1/L < 0.55$, where L is a distance from an object plane to an image plane in said projection optical system, wherein LM1 is a paraxial distance between the object and said first mirror, and LM2 is a paraxial distance between said first and second mirrors.

22. (Amended) A projection optical system according to Claim 9, wherein said first mirror group has a magnification BGM1, which satisfies a relation $-2.0 < 1/BGM1 < 0.4$.

23. (Amended) A projection optical system according to Claim 9, wherein said first imaging optical system has a lens group having a positive refracting power and disposed closest to the object side.

24. (Not Amended) A projection optical system according to Claim 9, wherein said first mirror group includes a lens of negative refracting power and said first mirror.

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25. (Not Amended) A projection optical system according to Claim 9, wherein said second mirror group includes said second mirror and a lens.

26. (Amended) A projection optical system according to Claim 9, wherein the abaxial light from the object passes through a lens of said second mirror group before it is incident on said first mirror group.

27. (Not Amended) A projection optical system according to Claim 9, wherein a positive lens, included by said field optical system, is disposed just after the image plane side of said first mirror group of said first imaging optical system.

28. (Amended) A projection optical system according to Claim 14, wherein a relation $0.45 < LFM1/LFM2 < 0.8$ is satisfied, where LFM1 is a distance between said second field mirror and said first field mirror, and LFM 2 is a distance between said second field mirror and the image plane.

29. (Not Amended) A projection optical system according to Claim 14, wherein said second field mirror group includes said second field mirror and a lens.

30. (Amended) A projection optical system according to Claim 14, wherein a positive lens, included by said field optical system, is disposed between said first mirror of said first imaging optical system and said second field mirror of said field optical system, wherein light reflected by said second mirror of said first imaging optical system passes through said positive lens and then is reflected by said first field mirror.

31. (Not Amended) A projection optical system according to Claim 1, wherein said projection optical system is telecentric with respect to each of the object side and the image plane side.

32. (Not Amended) A projection optical system according to Claim 1, wherein said projection optical system has a magnification of reduction ratio.

33. (Not Amended) A projection optical system according to Claim 1, further comprising a field stop disposed at the position of the image defined by said first

imaging optical system, for changing at least one of a size and a shape of an imaging region upon the image plane.

34. (Not Amended) A projection optical system according to Claim 1, further comprising a stop disposed inside said second imaging optical system.

35. (Amended) A projection exposure apparatus for projecting a pattern of a mask onto a substrate through a projection optical system as recited in Claim 1.

36. (Not Amended) A projection exposure apparatus according to Claim 35, wherein laser light from one of an ArF excimer laser and an F_2 excimer laser is used for the projection exposure.

37. (Amended) A device manufacturing method, comprising the steps of:

printing a device pattern on a wafer by exposure, using a projection exposure apparatus as recited in Claim 35; and

developing the exposed wafer.

Please add Claims 38-46 as follows:

38. (New) A projection optical system according to Claim 1, wherein said second imaging optical system includes two mirrors.

39. (New) A projection optical system according to Claim 1, wherein said first and second mirrors adjoin along an optical path.

40. (New) A projection optical system for projecting an image of an object onto an image plane, comprising:

a first imaging optical system for forming an image of the object, said first imaging optical system including a first mirror for reflecting and collecting abaxial light from the object;

a second imaging optical system for re-imaging the image upon the image plane;

a second mirror for reflecting light from said first mirror to the image plane side, whereby the abaxial light is caused to pass outside of an effective diameter of said first mirror; and

a field optical system including three lenses each having a positive refractive power,

wherein the abaxial light passed through the outside of the effective diameter of said first mirror is refracted by said three lenses toward a direction nearing an optical axis of said three lenses,

wherein light emitted from said three lenses is directed to said second imaging optical system.

41. (New) A projection optical system according to Claim 40, wherein said field optical system includes one lens having a negative refractive power.

42. (New) A projection optical system according to Claim 40, wherein said second imaging optical system includes two mirrors.

43. (New) A projection optical system according to Claim 40, wherein said first and second mirrors adjoin along an optical path.

44. (New) A projection optical system for projecting a pattern of a mask onto a substrate through a projection optical system as recited in Claim 40.

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45. (New) A projection optical system according to Claim 44, wherein laser light from one of an ArF excimer laser and an F_2 excimer laser is used for the projection optical system.

46. (New) A device manufacturing method, comprising the steps of:

printing a device pattern on a wafer by exposure, using a projection exposure apparatus as recited in Claim 44.

REMARKS

Claims 1, 2 and 9-46 are presented for consideration with Claims 1 and 40 being independent.

The specification and abstract have been reviewed and amended to correct minor informalities and improve their idiomatic English form.